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$$(x^2 + 5x - 7)(2x^2 - 7x - 9)$$

$$2x^4 - 7x^3 - 9x^2$$

$$10x^3 - 35x^2 - 45x$$

$$-14x^2 + 49x + 63$$

$$2x^4 + 3x^3 - 58x^2 + 49x + 63$$

$$26. \left(x + \frac{3}{5}\right)\left(x - \frac{2}{5}\right)$$

$$x^2 - \frac{2}{5}x + \frac{3}{5}x - \frac{6}{25}$$

$$x^2 + \frac{1}{5}x - \frac{6}{25}$$

$$28. (5x^2 + 2)(6x^2 + 2)$$

$$30x^4 + 10x^2 + 12x^2 + 4$$

$$30x^4 + 22x^2 + 4$$

$$34. (x^2 + 4)^2 = (x^2 + 4)(x^2 + 4)$$

$$\begin{array}{r} x^4 + 4x^2 + 4x^2 + 16 \\ \hline \end{array}$$

$$x^4 + 8x^2 + 16$$

$$38. (x + 3)(x^2 + 5x - 8)$$

$$\begin{array}{r} x^3 + 5x^2 - 8x \\ 3x^2 + 15x - 24 \\ \hline \end{array}$$

$$x^3 + 8x^2 + 7x - 24$$

$$42. (3 + b)(2 - 5b - 3b^2)$$

$$6 - 15b - 9b^2$$

$$2b - 5b^2 - 3b^3$$

$$6 - 13b - 14b^2 - 3b^3$$

$$44. (y - 1)^3 = (y-1) \underbrace{(y-1)(y-1)}_{\text{pink box}}$$

$$(y-1) (y^2 - y - y + 1)$$

$$(y-1) (y^2 - 2y + 1)$$

$$\begin{array}{r} y^3 - 2y^2 + y \\ - y^2 + 2y - 1 \\ \hline y^3 - 3y^2 + 3y - 1 \end{array}$$

46. $(3x + 4)^3$

50. $(4x - 5)(8x^2 + 2x - 4)$

52. $(3x^2 - x + 2)(x^2 + 2x + 1)$

$$56. -5x(x^2 - 3x + 10) = -5x^3 + 15x^2 - 50x$$

$$60. \left(m + \frac{2}{9}\right) \left(m - \frac{1}{9}\right)$$

$$m^2 - \frac{1}{9}m + \frac{2}{9}m - \frac{2}{81}$$

$$m^2 + \frac{1}{9}m - \frac{2}{81}$$

$$68. (5x + 4)(x^2 - x + 4)$$

$$5x^3 - 5x^2 + 20x$$

$$4x^2 - 4x + 16$$

$$5x^3 - x^2 + 16x + 16$$

70. $(a^2 + 3a - 2)(2a^2 - 5a - 1)$

$$2a^4 - 5a^3 - a^2$$

$$+ 6a^3 - 15a^2 - 3a$$

$$- 4a^2 + 10a + 2$$

$$2a^4 + a^3 - 20a^2 + 7a + 2$$

5.4: Special Products

Ex: (p 334)

4. $(y - 12)(y + 4)$

6. $(3y - 5)(2y - 7)$

12. $(x + 7)^2$

24. $(4x - 5)(4x + 5)$

26. $\left(10x + \frac{2}{7}\right)\left(10x - \frac{2}{7}\right)$

28. $(2x - y)(2x + y)$

36. $(6a + 7)(6a + 5)$

38. $(x - 10)(x + 10)$

42. $(x^3 - 2)(5x + y)$

44. $(x - 2)(x^2 - 4x + 2)$

48. $(11x - 7y)(11x + 7y)$

54. $(x^5 + 5)(x^2 - 8)$

62. $\left(\frac{2}{3}a - b^2\right)\left(\frac{2}{3}a - b^2\right)$

70. $(3x + 5)(3x - 5)$

74. $\left(\frac{a}{2} + 4y\right)\left(\frac{a}{2} - 4y\right)$

78. $(b + 3)(2b^2 + b - 3)$

82. $\frac{x^3y^6}{xy^2}$

84. $\frac{-6a^8y}{3a^4y}$

86. $\frac{-48ab^6}{32ab^3}$

5.5: Negative Exponents & Scientific Notation

Look at division

Negative Exponents

If a is a real number other than 0 and n is an integer, then

$$a^{-n} = \frac{1}{a^n}$$

Negative Exponents

If a is a real number other than 0 and n is an integer, then

$$a^{-n} = \frac{1}{a^n} \quad \text{and} \quad \frac{1}{a^{-n}} = a^n$$

Ex: (p 343)

2. 6^{-2}

8. $\left(\frac{1}{8}\right)^{-2}$

16. $\frac{r^{-5}}{s^{-2}}$

22. $4^{-2} - 4^{-3}$

24. $\frac{-1}{y^{-6}}$

Summary of Exponent Rules

If m and n are integers and a , b , and c are real numbers, then:

Product rule for exponents: $a^m \cdot a^n = a^{m+n}$

Power rule for exponents: $(a^m)^n = a^{m \cdot n}$

Power of a product: $(ab)^n = a^n b^n$

Power of a quotient: $\left(\frac{a}{c}\right)^n = \frac{a^n}{c^n}$, $c \neq 0$

Quotient rule for exponents: $\frac{a^m}{a^n} = a^{m-n}$, $a \neq 0$

Zero exponent: $a^0 = 1$, $a \neq 0$

Negative exponent: $a^{-n} = \frac{1}{a^n}$, $a \neq 0$

Ex: (p 343)

$$46. \frac{-5x^4y^5}{15x^4y^2}$$

$$48. (-5a^4b^{-7})(-a^{-4}b^3)$$

$$52. \left(\frac{a^5b}{a^7b^{-2}}\right)^{-3}$$

$$56. \frac{5^{-1}z^7}{5^{-2}z^9}$$

$$58. \frac{6^{-5}x^{-1}y^2}{6^{-2}x^{-4}y^4}$$

$$60. \left(\frac{r^{-2}s^{-3}}{r^{-4}s^{-3}}\right)^{-3}$$

$$68. \frac{(a^6b^{-2})^4}{(4a^{-3}b^{-3})^3}$$

5.6: Dividing Polynomials

Dividing a Polynomial By a Monomial

Divide each term of the polynomial by the monomial.

$$\frac{a + b}{c} = \frac{a}{c} + \frac{b}{c}, \quad c \neq 0$$

Ex: (p 350)

2. $\frac{15x^2 - 9x^5}{x}$

4. $\frac{8x^3 - 4x^2 + 6x + 2}{2}$

8. $\frac{6x^5 + 3x^4}{3x^4}$

34. $\frac{m^3n^2 - mn^4}{mn}$